To all whom it may concern:

Be it known that I, Joseph E. Downer, a citizen of the United States of America, residing at Allenport, in the county of Washington and State of Pennsylvania, have invented certain new and useful Improvements in Oil-Well Drills, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in oil-well drills, and more particularly to a novel form of lock which is adapted to lock the different sections of a drill together to prevent them from becoming disjoined.

The invention has for its object the provision of a novel form of lock which can be conveniently used in connection with oil-well drills. The ordinary type of oil-well drills is composed of a plurality of parts connected together by screw-threads, and during the operation of using these drills they frequently become disjoined and in the majority of instances cannot be removed from the well. The lock which I have constructed is adapted to prevent the different sections of an oil-well drill from becoming disjoined, and I have provided novel means for manipulating the lock in connection with oil-drills.

Briefly described, my improved lock consists in providing an oil-drill member with a recess in which is mounted a corrugated wheel having a square depending lug and of providing the other section of drill with a slot in its end in which the depending lug of the corrugated wheel is adapted to engage after the one member has been secured within the other. I employ a spring for retaining the square lug within the section of drill and employ a wedge for holding the lock in an elevated position, whereby the section of drill cannot be disjoined.

The above construction will be hereinafter more fully described and then specifically pointed out in the claims, and, referring to the drawings accompanying this application, like numerals of reference designate corresponding parts throughout the several views, in which—

Figure 1 is a vertical sectional view of a portion of two drill-sections secured together. Fig. 2 is a transverse sectional view taken on the line x-x of Fig. 1. Fig. 3 is a similar view taken on the line y-y of Fig. 1. Fig. 4 is a detail view, partly in section, of a gage which is employed in connection with my improved lock; and Fig. 5 is a top plan view of one of the sections of the drill.

In the accompanying drawings I have illustrated two sections of a drill which are secured together by the ordinary form of screw-threads.

The reference-numeral 1 designates one of the sections of the drill, which will be hereinafter termed the "female member," and the reference-numeral 2 designates another section of the drill, which will be hereinafter termed the "male member." It is the common practice now to employ the screw-threads to secure these two members together, and considerable trouble has been experienced in the members becoming disjoined while they were being used within the well, and for this reason I have provided a lock for securing the member 2 to the member 1. In providing this lock the drills in present use can be constructed in accordance with my invention, and I provide the male member 2 with a slot, which is preferably formed in the upper end of the member and is substantially rectangular in cross-section. (See Fig. 5.) The female member 1 is provided with a toothed or corrugated recess 5, this recess being formed in the end of the screw-threaded socket of the member 1. Formed in the bottom of the toothed or corrugated recess 5 is a recess 6, which extends within the body portion of the female member 1, preferably central of said member.

The reference-numeral 7 designates a slot which is formed transversely of the female member 1 and is adapted to communicate with the central recess 6.

The reference-numeral 8 designates a rod which is mounted in the recess 6, this rod having swiveled upon its lower end, as indicated at 9, the corrugated or toothed locking member 10, which is provided with a depending
stud 11 upon its lower face. The upper end of the rod 8 is connected, as indicated at 12, to a spring 14, which is mounted in the upper end of the recess 6, and this spring normally has a tendency to force the rod 8 downwardly. In Fig. 1 of the drawings the spring is illustrated as being depressed and is retained in this position by a wedge-shaped key 15, which passes through the slot 7 and a slot 16 formed in the rod 8.

The locking member 10 is substantially the same size as the recess 5, and the depending stud 11 is substantially the same shape in cross-section as the slot 4.

To lock the member 2 within the female member 1, the wedge 15 is removed, at which time the spring 14 will force the rod 8, locking member 10, and stud 11 downwardly, the stud engaging in the recess 4. The member 2 is prevented from rotating in the member 1 by the toothed or corrugated recess 5 and locking member 10 and also by the substantially rectangular shaped stud 11 fitting within the slot 4. By referring to Fig. 3 of the drawings it will be observed that the teeth or corrugations of the locking member 10 snugly fit within the grooves formed by the teeth or corrugations of the recess 5.

Should it be desired to remove the drill member 2, the wedge-shaped key 15 is inserted in the slot 7 and the tapered end of the key engaged in the edge of the slot 16, and upon the wedge-shaped key being driven inwardly the rod 8, the locking member 10, and the stud 11 are raised within the recess 5 and the member 2 of the drill can be removed and removed from the female member 1.

In Fig. 4 of the drawings I have illustrated a gage, which consists of a spanner-head 17 and a bar 18 substantially parallel to the spanner-head 17. The gage is employed for a number of purposes—namely, when the drill is not being used the gage is inserted in the end of the drill to engage the stud 11 and raise the same so as to further aid in placing the wedge-shaped key within the slot 16, it also being used to engage the locking member 10 and reseat the same in the recess 5. This is accomplished by removing the wedge-shaped key 15, permitting the locking member 10 to extend outside of the recess 5, at which time it can be rotated, this being permitted by the swivel 9, at which time it can be reseated within the recess 5.

While I have herein described my improved locking device as being applicable to oil-well drills, it is obvious that the same may be used in connection with other drills and for joining two screw-threaded members together.

It will be noted that various changes may be made in the details of construction without departing from the general spirit and scope of the invention.

What I claim, and desire to secure by Letters Patent, is—

1. The combination with a male and a female section of a drill, of a lock for holding the sections against independent rotation when connected together, and embodying a locking member fitting in a recess in the female member and having peripheral lugs engaging in grooves in said female member, a lug carried by said locking member to engage in a slot provided therefor in the upper end of the male member, a rod or stem connected to the upper face of the locking member and extending into the female member and having a transverse slot, and means for engagement in said transverse slot for elevating the lug of the locking member out of engagement with said slot in the male member.

2. The combination with two drill-sections, adapted to be screwed together, of a locking member mounted in one of said sections, a rod rotatably connected to said locking member and extending within said section, the other of said sections having a slot formed therein, a stud carried by said locking member, means for normally holding said stud in engagement with said slot, and means to hold said stud in an elevated position out of engagement with said slot, substantially as described.

3. The combination with two sections of a drill, one of said sections having recesses formed therein, said section having a slot formed therein communicating with one of said recesses, a locking member mounted in one of said recesses, a swiveled rod connected to said locking member and extending within the other of said recesses, the other section of drill having a slot formed therein, means to normally hold said locking member in engagement with said slot, and means to elevate said locking member out of engagement with said slot, substantially as described.

4. A lock of the type described comprising a movable locking member, a rod rotatably connected to said member, a stud carried by said locking member, means to support said locking member, and means to elevate said locking member, substantially as described.

5. In sectional drills, a lock for securing the sections against independent rotation, and embodying a drill-section having grooves, a drill-section having a slot and a locking member having peripheral lugs engaging the grooves in one of the drill-sections and having a lug to engage the slot in the other of the drill-sections, and a rod connected to the upper face of said locking member.

In testimony whereof I affix my signature in the presence of two witnesses.

JOSEPH E. DOWNER.

Witnesses:
PETER SPEICHER,
WILLIAM H. ATKINS.